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cians, and fortune-tellers,* and also farriers, tinkers, and form separate tribes (ils) under Nomadic chiefs. They are, besides, considered good runners, hence all shatirs (runners) of the king belong to this race.

The colony of Europeans consists, exclusive of embassies, consulates, some merchants (French, Greek, German, Swiss, and Russians), and some foreign officers and physicians in the service of the shah, on the whole of scarcely more than one hundred individuals. They live in Tabris and Teheran; three families are in Resht, and one family lives in Shiraz. The European finds no home here; he is in a state of isolation, and is shunned by the natives. There is no case known to me that a European adopts Persia as his second fatherland, as is the case in Egypt and Turkey. Cut off, by the difficulty of communication, from the civilised world of Europe, and separated from the female population by law and custom, so that he rarely sees an unveiled face, the character of the European, who is obliged to remain here, undergoes a change; he loses his energy, becomes unsociable and peevish, even with his fellow European sufferers.

BROCA ON ANTHROPOLOGY.

[*Concluded from vol. v, page 204.*]

IN order to give an idea of the complexity of certain questions of general anthropology, and to show how they may be solved by the analytical method, we shall, as an example, select one of the most controverted subjects, and search for the cause of the numerous varieties observed in the Indo-European races.

Linguistics have established the fact, that nearly all the peoples of Europe, America, Persia, Cabul, Beluchistan, Hindustan, speak dialects of the same primitive language, the common mould of the Zend and the Sanscrit. It has hence been concluded that a primitive people, issuing probably from a region to the north of Persia, had sent colonies and extended its branches on the one side to the borders of the Ganges, and on the other to the shores of the Atlantic—without speaking of recent migrations, by which the European races and

* Dr. Cloquet related to me:—"During my stay in the Royal Camp at Sultanieh, a gipsy woman came up to me to tell me my fortune from a large printed sheet; I immediately perceived that it was a number of the *Journal des Debats*, which I afterwards heard was presented to her by General Terrier for some service she had rendered him."

languages have spread in the New World, Australia, and many other regions. Here we have a fact well established.

At the time when the Indo-European peoples first set foot in Europe, they did not find that region altogether deserted; it had been occupied before their arrival by an autochthonous population. There are still found, at the two extreme ends of Europe, the Basques and the Fins, whose languages are incontestably derived from these autochthones. But elsewhere there remains neither in the language nor in the traditions any trace, any remembrance, of a people prior to the arrival of the Indo-Europeans, so that the existence of these primitive peoples might be doubted if their crania had not been discovered in the turf-pits, in the graves of the stone period, in the ossiferous caves, and in the diluvium. This decisive testimony supplies the silence of history. Here, then, is a second fact now generally accepted.

This being granted, the Indo-European peoples, considered by the incontestable filiation of their languages as issued from one and the same race, present considerable differences. Some are dolichocephalic, others brachycephalic. They are tall or short, have very fair or very dark complexions, with all intermediate shades, from the Scandinavian, with his blue eyes, his pale hair, his white skin, to the Hindoo, with black eyes and black hair and a bronzed skin. Finally, these peoples differ in manners, taste, aptitude, industry, art, literature, science, —in their religious tendencies, their politics, at least as much as in their physical characteristics.

In order to explain these differences of stature, of cephalic type, intelligence, etc., several hypotheses may be advanced, based upon the various conditions to which the different branches issued from a common stock have been subjected in the respective regions to which they have been transplanted. Each of these migratory peoples has several times changed its abode, climate, social condition, alimentation, and mode of life. Some have remained for a long time or are still in a semi-barbarous state. Others have been civilised from the highest antiquity. All finally have, from the first, found themselves in the presence of autochthones, whom they have vanquished, displaced, denationalised, destroying their language and history, casting their very nature into oblivion, but whom they certainly could not have exterminated all at once.

Temperature, hygrometric conditions, altitude, alimentation, mode of life, industry, civilisation, and intermixture of races—all these influences taken separately or by the combination of some of these, have given rise to numerous hypotheses, in order to explain the actual diversity of the Indo-European peoples.

The fair complexioned Scandinavians, living in a cold country, and the bronzed Hindoos living in the torrid zone, has at first led to the supposition that the differences of coloration depended on temperature. But the Rohillas of Hindustan have a white skin, blue eyes, fair hair; whilst men with dark eyes and dark hair form the majority in certain districts of Ireland, Wales, and the Scottish highlands. The Gipsies, who came from India and spread over Europe since the 12th century, have in the cold countries, even to the Cheviot Hills, preserved the tawny complexion and the black eyes and hair of the Hindoos. The German colony in Paraguay, founded in the fifteenth century by the soldiers of Charles the Fifth, having remained pure by non-intermixture, presents a parallel instance of an Indo-European people remaining as fair under the tropic of Capricorn as on the banks of the Elbe.* Consequently, if there exist brown or fair Indo-Europeans, it does not depend on temperature. In reviewing the other climatic conditions, we find in the same way, by numerous examples, that they are incapable of producing the result in question.

We then arrive at influences of another order, which have not been considered as influencing the coloration, but which appeared to explain the variations in stature and muscular force. These are alimentation, mode of life, and subsidiarily industry, which leads to comfort. Two hypotheses are here face to face. It has been admitted that the social condition—that is to say, civilisation—by affording regular subsistence, abundant alimentation, gradually tends to increase both the height and physical force. Or, on the contrary, it has been admitted that civilisation, being unnatural, tends to develop the mind at the expense of the body, and in course of time renders man weaker and shorter. Both these hypotheses rest upon a certain number of facts, or rather coincidences. Thus the Græco-Latin people, civilised before the Germans, Scandinavians, and Slavonians, are shorter than the latter; but the Bas-Bretons are shorter than the Belgians, the Normans, and the Provençals, who have been civilised long before them. Many other facts might be cited in support of either of these hypotheses, which mutually destroy each other. It does not result from this that the conditions of existence have no influence upon stature; but thus much results, that the variation in stature of Indo-European peoples cannot be explained by these conditions.

It has finally been supposed that the variations of the cephalic

* A similar Spanish family, remaining perfectly fair and purely Gothic, from non-intermarriage with darker types, and in position and rank holding for centuries official supremacy, is to be found in Yucatan at the present day.—ED. ANTH. REV.

type constituting brachycephaly and dolichocephaly might depend on intellectual culture ; that the brain might, like the rest of the organs, be developed by exercise ; that the most active organs of the brain might become more developed than the rest ; and that consequently the degree and the nature of civilisation might modify both the volume and the form of the cranium. But, on the one hand, in taking a general view on the subject, we find that there subsists no relation between the brachycephalic and the dolichocephalic types as regards the intellectual value of races. The Teutonic races which occupy the first rank in the human series, are dolichocephalic, like the Ethiopian and Australian races, which stand last. Brachycephaly belongs to the Slavonians, the Turks, the Mantchoos, the Papuas, and numbers of other peoples occupying all degrees of the scale, without including the present French and South Germany, which are on the average nearly brachycephalic. On the other hand, from a special point of view of the Indo-Europeans, we find that the Scandinavians are more dolichocephalous than the Hindoos ; these, again, are more so than the French ; and that no relation can be established between the cephalic type of these different peoples and their civilisation either in the past or the present.

Having thus passed in review all these influences, and recognised that none of them explains the variations produced in the Indo-European nations, we arrive, by way of elimination, at another hypothesis which, without pretending to be rigorously demonstrated, possesses at least the advantage that it better explains all the facts and meets all objections. The existence of a primitive, or at all events an anterior population, at the arrival of the Indo-Europeans, has been established by human palæontology wherever persevering researches have been made. Among these aboriginal populations some were brachycephalic, others dolichocephalic ; some were tall, others were short. The intermixture of the conquerors with the vanquished naturally explains all the variations in stature and cephalic type. Palæontology teaches us nothing as regards the colour of the eyes and hair of the aboriginals ; but these have not altogether disappeared, and where they still exist, as in Hindustan and the region of the Pyrenees, they present, in reference to these characters, the greatest analogy to the Indo-Europeans adjoining them. All this is explained by the intermixture of races. The Indo-European idioms imported by the conquerors have prevailed over the indigenous languages, and have alone survived ; but the indigenous people have not, for all that, disappeared. Although losing their language, their name, their nationality, they have not ceased to exist. The complete extermination of one race by another race is a phenomenon nearly impossible,

considering the condition in which the immigrant peoples found themselves. The intermixture of blood was an inevitable consequence of these immigrations, and, in proportion to the numerical preponderance of either race, the cross-breed resulting from this intermixture approached more or less to the indigenous or the foreign type. Nothing more is required in order to understand the diversity of the physical characters of the peoples now speaking the Indo-European idioms; and this theory of intermixture explaining all the facts, and being open to no objection, presents itself invested with every scientific probability.

This rather long digression seemed to us necessary, in order to show, by a very complicated example, how the analytical method may be applied to the study of anthropological questions.

The preceding example has, moreover, shown that great difficulties arise from the great diversity of intrinsic or extrinsic conditions amidst which the races under examination find themselves. All the characters they present are not of equal importance; some are more, others less, significative. If all tended in the same direction; if all the peoples of the same colour possessed the same stature, hair, cranial conformation—the same degree of intelligence, the same inclinations, the same language; if all of these were under the same, or at least a very similar climate; if all had at the same, or nearly the same, epochs arrived at the same social level—the task of anthropology would be an easy one; but it is not so. The anatomical, physiological, psychological, climateric, and other facts combine and cross each other in a thousand ways. One character establishes an approximation, whilst other characters establish profound differences; and there result from this, continual contradictions, which, however, are and must be only apparent, and which will disappear when the whole truth becomes known, but which hitherto have given rise to difficulties and dissidence.

The naturalists also have had to contend with difficulties of the same nature, and if, after many failures, they have succeeded in giving to their science a positive character, it is because they have recognised the necessity of adopting a principle of co-ordination secured from the inroad of fancy. This principle is that of the subordination of character. This is not the place to expound it, to demonstrate its value, and to teach its applications. No one, moreover, ignores that it is one of the most essential bases of the natural method.

The aim of the anthropologist should be to apply as much as possible to his science the principles of the natural method, a proposition which requires no demonstration. But among the characters diversifying the human group there are some which properly belong to it,

or are only found in a rudimentary state in other zoological groups. The particular considerations, according to which the naturalist establishes the subordination of characters, are thus insufficient for the anthropologist. In the presence of anatomical or morphological facts, whose relative value notably differs in the various degrees of the animal scale, there are other characters of quite a different order claiming a place which must be determined. When we consider that man is distinguished from other animals more by his intelligence than by his physical form, we can easily understand why some anthropologists have, in the classification of human races, assigned the first rank to psychical characters, by which humanity has acquired domination on the globe, and to assign the second place to physical characters, by which man so nearly approaches the anthropomorphous apes.

But the question should not be put in this way. Here it is not the question to distinguish the human genus from other groups, but to subdivide it into secondary groups as clearly defined and as natural as possible. It is necessary to base this division upon what is most fixed in the organisation of man, upon that which most resists the influences capable of modifying the individual or the race. Now, it is unquestionable that the physical characters are more permanent than the others, and that, consequently, they deserve the preference.

No doubt, languages, manners, industry, religion, all kinds of aptitudes, establish profound differences between the various races of mankind. But these characters, the study of which is as interesting as it is important, become frequently modified by circumstances, and may vary considerably in peoples of the same race. We cannot therefore assign to them any supremacy. There is, nevertheless, one which deserves special attention, and which plays a principal part in a great number of anthropological questions; so much so, that some others have felt justified in making it the almost exclusive basis for the classification of races. We speak of language. Linguistics render the most marked services to anthropology. Two peoples belonging to different races are separated from each other by several thousands of miles; they are so much strangers to each other that, neither in their respective histories, nor those of other peoples, is any mention found of their original parentage, and yet these peoples who have never heard of each other speak very similar idioms. The words are not the same, but the roots are. The grammar is nearly the same, and it becomes certain that these two languages had the same origin; consequently, the peoples speaking that language should, despite their actual dissemblances, have had common ancestors. On the other hand, there are two groups of races, which, since the origin of history, have always moved side by side, who have more than once intermixed,

who have interchanged their civilisation and religion, and who, as regards physical characters, present no very marked differences; such are the Indo-European and the Syro-Arab, improperly called Semitic, races. Now, despite their vicinity, their similarity of type, and various intermixtures, despite the fundamental community of facts, despite more or less durable political fusion, these two groups of races speak languages so distinct that the most eminent linguists have despaired of reducing them to a common origin. (See Renan, *Histoire Générale et Système comparé des Langues Sémitiques*. Paris, 1858.)

These inverse examples show the importance furnished by linguistics. These characters present, besides, a remarkable permanence. The *spontaneous* modifications introduced in the course of generations, either in grammar or words, however great they may appear, are of but a secondary order, the primitive type of the language continuing to subsist. This has been the case in all cases scientifically known; and these spontaneous modifications of words and grammatical forms constitute a sort of evolution subject to certain laws.

The linguistic characters have hereby acquired such a degree of precision that it has become easy to establish in languages methodical divisions and subdivisions, to distinguish a certain number of trunks dividing in primary, secondary, etc., branches, and thus to institute a taxonomy as regular, as positive, and as complete as that based upon physical characters. We may state here at once that in many cases the groups based on linguistics coincide pretty nearly with the groups based upon the anatomo-physiological study of human races. But when these two orders of research lead to contradictory conclusions—as we have seen in the example of the variations of physical characters in peoples speaking the Indo-European tongues—it then becomes necessary to choose between the evidence of direct observation and that of linguistics, and to subordinate the characters drawn from language to those drawn from organisation, or *vice versâ*. Naturalists readily give the preference to the latter; linguists place the former in the first rank. In order, then, to give to these difficulties a scientific solution, it becomes necessary to establish, on positive considerations, the relative value of the two orders of characters.

Every one admits that the distinctive characters of the races of man acquire value in proportion to their permanence. This is a general principle of natural history, and is also that of linguistics. The question, therefore, is whether the organisation of man is more or less permanent than his language. This question would not arise if the absolute and continuous immutability of the physical type were completely demonstrated. It is clear that languages become modified in

time; if immense researches were required to discover the affinity and the filiation of the Celtic, Hellenic, Latin, Germanic, Slavonian, Persian, and Hindoo languages, it is because fifty or sixty centuries have so greatly altered them. Neither the Italian nor the French peasant understands the Latin tongue, which their ancestors spoke twelve or thirteen centuries ago, and it is more than two centuries since the language of Sire de Joinville, the companion of St. Louis, has become unintelligible to most Frenchmen. These modifications may be slight, but they correspond with very short periods; and besides, however slight they may appear in the eyes of linguists, they are palpable and evident, and they become even considerable from a political point of view; for the primary condition of a political solidarity is unity of language.

Linguistic characters are therefore not absolutely permanent. The limits of the changes they may undergo are as yet not strictly determined. These are essential features, fundamental characters, which, in all known cases, have maintained themselves without alteration in all languages from the same stock; and nothing has hitherto confirmed the hypothesis of unitarian linguists, who, in order to conciliate the actual state of things with the idea of one primitive language, have supposed that the type of languages may, within a number of centuries, undergo a total transformation. But whilst the limits of a spontaneous alteration of languages are as yet undetermined, one point is sufficiently established, that these limits are of great extension.

The question of the permanence of physical types is not less controverted than that of linguistic types. The Darwinists assume that all animals, including man, are derived from a small number of simple beings, possibly from a primordial monad; the Monogenists, with much less boldness, are of opinion that all human races are derived, if not from a single couple, at least from a certain number of primitive men perfectly resembling each other. The Polygenists finally assert that human types are only liable to slight modifications; that the chief physical characters are permanent; and that, consequently, the actual diversity of races can only be attributed to the multiplicity of their origin.

Here, as in the preceding case, the divergence of opinions is in proportion to the duration of the intervening time. When we hold to the period of time of which we possess historical, archæological, or anatomical records, it is found the types of races are permanent, or rather that they have not appreciably changed in races who have not intermixed, and even in such as have more or less crossed. But when, on the other hand, we consider that the few thousand years to which our history extends in the life of humanity is an extremely

short period, we may admit, if not as demonstrable, at least as quite possible, that the modification of types, too slow and too slight to be perceptible after five or six thousand years, may, after lapse of two or three thousand centuries, have affected the different races issued from one primitive stock.

Finally, if we plunge further into the unknown past, and count by millions of years, we arrive, with the school of Darwin, at conceiving the possibility of a universal brotherhood, not merely with negroes and Australians, but with apes, fishes, molluses, and zoophytes.

From these discussions concerning origin, emerges a perfectly positive fact—namely, that physical characters are but little variable, and though they become modified under a prolonged influence of media, the process is extremely slow. Upon the ancient monuments of Egypt, nearly four thousand years old, there are representations of Negroes, Jews, Greeks, Mongols, Hindoos, and of natives. All these types were as distinct then as they are now. Since then they have not changed perceptibly, whether in the Valley of the Nile, the adjacent districts, or in distant regions where the conquering Egyptians penetrated. The celebrated cranium of New Orleans, found in a deep bed beneath a series of cypress forests, successively submerged by the alluvia of the Mississippi, presents the actual type of the indigenous race of South America. All the efforts made to reduce the antiquity of this cranium have failed to make it less than fifteen thousand years. The present type of the red-skins did thus exist at least one hundred and fifty centuries ago; it has not changed since then, and yet, during a period not half so long, the Indo-European languages have become so much modified as to be scarcely recognisable.

These facts, which might easily be multiplied, do not pretend to establish the *absolute* permanence of the physical types. There is a change which escapes us, because of its slowness, but which might become apparent if the observation could be extended to periods eight or ten times as long. What we here wish to establish is the relative degree of permanence in physical and linguistic characters, and there can be no doubt that languages—the work of man—are much less stable than organisation—the work of nature.

If, therefore, instead of considering the gradual mutations which supervene *spontaneously*, from century to century, in all languages not fixed by a strong literary organisation, we consider the most rapid changes effected under the influence of political and social circumstances, we see radical transformations, complete substitutions, resulting in the disappearance of a language, without those who spoke it ceasing to resemble each other in every other respect.

The Cornish, a Celtic dialect spoken up to the middle of the eigh-

teenth century, has gradually been supplanted by the English language. In the same way the French is superseding the *patois* of the south. May be that not a century will elapse before all the *patois* dialects have become dead languages. The Breton dialects, Celtic idioms of the ancient province of Brittany, are already banished from Lower Brittany, and will certainly, sooner or later, be displaced by the French language; and the Basque, finally, which most linguists consider the oldest of all known languages, will, no doubt, disappear in its turn: for this language has, for a century past, lost much of its territory. On the two slopes of the Pyrenees, French and Spanish are already spoken in all important towns; in many villages they begin to displace the Basque, and it requires no prophetic power to foresee that ere long they will penetrate into the hamlets.

These substitutions of languages proceed slowly in time of peace, without any intermixture of races, by the simple effect of political conditions and education. The new language first reaches the higher and then the middle classes. The peasant is in his turn obliged to learn it, and the old language becomes gradually extinct. These facts occur daily around us, in proportion as modern nationalities become consolidated; and thus it happened many a time, both in the past and the present, that numerous populations, nay, entire peoples, have ended by exchanging their languages without experiencing in their physical characters any serious modification. It is true that more frequently the substitutions of languages have been produced by political catastrophes, immigrations, or conquests. Conquering peoples have been known, in course of time, to impose their language on the vanquished; on the other hand, the latter have also maintained their languages, whilst the foreign conquerors forgot their own. In either case, both populations become, sooner or later, inevitably fused, and there arises a mixed population which takes more or less after either of these races. This intermixture of blood always takes place in unequal proportions. The physical type alters at first in proportion to the intensity of the intermixture; then the hybrid race tends, in the course of generations, to return to the type of the most numerous mother race. The physical characters which survive the intermixture, with more or less purity, are those which belonged to the numerically predominant race, whilst, on the contrary, the surviving language is frequently that of the less numerous race. There is thus no parallelism; there is even an apparent contradiction between the linguistic fact and that of anthropology proper.

It results from this somewhat lengthy exposition, rendered necessary by the pretensions of a certain school, that in anthropology the

characters of the first order must be taken from the study of the organisation.

In other words, when there is a contradiction between linguistic and physical facts, the preference must be given to the latter. Linguistics are, nevertheless, most precious auxiliaries of anthropology; but the furnished information cannot be looked upon as a decree. The results of philology are positive; they even possess a degree of precision, certainty, and simplicity rarely found in the study of physical characters; but these results once acquired require interpretation, which the anthropologist only is able to give with any certainty.

The principle of the subordination of characters must now be extended to various physical characters. They are not all of equal importance, nor have all of them the same degree of permanence; but this degree of comparative permanence is as yet not sufficiently determined to make it the object of a methodic subordination. It cannot be done without the assumed solution of a number of contested questions. We must thus confine ourselves to consider the characters with regard to their own importance. Now, whether taking a purely zoological or a physiological stand-point, we are authorised to rely upon the relative characters of the skeleton of the head as more important than all the rest; and it is for this reason that Isid. Geoffroy Saint-Hilaire bases exclusively upon the study of these characters the determination of the four grand types around which he groups all the human races, distinguishing after these the secondary characters, such as the colour of the skin, the nature and implantation of the hair, the shape of the nose, the direction of the eyes, etc. (*Isid. Geoffroy Saint-Hilaire, Sur la Classification Anthropologique et sur les types principaux du genre humain*, in the *Mémoires de la Société d'Anthropologie*, tom. i, p. 125-144. Paris, 1860. 8vo.)

There now remain characters of a different order, which no doubt are connected with organisation, with the cerebral constitution of races, but must not be confounded with organic characters. We speak of aptitudes intellectual, moral, and social. There exist races eminently perfectible, who enjoyed the advantage of outstripping all the rest, and engendering high civilisation. There are, again, some who have never taken the initiative in progress, but who have accepted or adopted it by imitation. Others, finally, have resisted all the efforts made to rescue them from a savage life, thus proving the unequal degree of *perfectibility* possessed by the various races of mankind. A character so important as this, the consequences of which were enormous in the past history of humanity, as they must

be in the future—is this character subordinate to those of the eyes, skin, or hair?

We have no hesitation in replying, yes. Perfectibility is one of the most interesting elements in the study of races, but it is impossible to constitute it an element of classification. Perfectibility is not a simple faculty, it is only a result, being a manifestation of a congeries of intellectual faculties. The absence of perfectibility does not indicate the absence of these faculties, but only their impotence in mastering the inclinations and instincts which maintain man in a savage state; and according to external circumstances, difficulties or facilities of existence, mildness or rigour of the climate, more or less, call forth efforts of intelligence; so will people of the *same race*, and consequently endowed with an equal degree of perfectibility, manifest the latter in a manner extremely unequal. An infinite number of centuries have elapsed before the first civilisation of humanity; and Egypt had already reached a high degree of splendour, whilst the whole of Europe was still plunged in the darkness of profound barbarism. Perfectibility, although inherent in the primordial organisation of numbers of races, may thus remain latent during an indefinite lapse of time before it manifests itself; and when a people presents itself before us in the most abject intellectual and social condition, we must ask ourselves whether this people is really refractory to progress, or whether it only requires for its elevation from a savage state a concurrence of favourable circumstances. The solution of this problem is not always possible. There are cases in which the past is of such a nature as to leave no illusion as regards the future. Never has a people with a black skin, woolly hair, and a prognathous face, spontaneously arrived at civilisation. The African negroes, which are far from occupying the last rank in the human series, have never been able to give to their societies the stability which is the essential condition of progress, and there has never been seen a government uniting into nations the savage tribes of Australians or Pelagianin negroes (or Melanesians). But by the side of these examples, which unfortunately are too clear, there is a considerable number, the interpretation of which, doubtful now, may perhaps remain doubtful for many centuries to come. Perfectibility is, therefore, not one of those characters which necessarily result from the study of a race. It should occupy a large place in the study of the anthropologist; but it is too difficult to be determined—it is connected with elements too variable and too complex to make it intervene as a general term in the characteristics of races. And what we say of the ensemble of the qualities and faculties which preside at the organisation of societies and the birth of civilisations, applies more

strongly to special industrial, political, artistic, literary, scientific, religious, or other aptitudes, when determining the form of each civilisation.

In the preceding exposition, by descanting on the method and essential principles of general anthropology, we have at the same time glanced at or indicated a great number of questions which belong to its domain. We have no intention of exhausting our enumeration of the subjects of study, but we deem it our duty to touch upon some which, either by their scientific interest or their practical importance, deserve particular attention. We do so for the purpose of showing the concatenation of certain anthropological questions.

The investigation of origin, taking this word in its absolute sense, pertains not to science ; for beyond observed facts, beyond more remote facts discovered by way of induction, and still more remote ones which are only approached by hypothesis, there still remain, and ever will remain, primordial facts in the presence of which hypothesis remains dumb and powerless. Scientific research in such cases, according to the nature of the mind, yields its place to philosophical doubts or to faith. The Darwinian hypothesis, the boldest which can be cited, carries back the problem of origin to the apparition of the first monad ; but the fact of the first transition of inorganic into organised matter, which can neither be explained nor divined, is beyond the extreme limit of what can be known, for it is only a play of words to say that matter has the property of organising itself when it finds itself placed in favourable conditions.

The hypothesis of Darwin on the origin of species forms no essential part of anthropology, yet it is inseparable from the research concerning the origin of man, or rather the human type.

Anthropology proper embraces, in the history of the globe, only the human period ; and the first question that presents itself is that of the antiquity of the human species. The time is past when the age of humanity was computed by years. Man has left traces of his existence, marks of his industry, and remains of his body in geological strata, the antiquity of which is beyond computation. He has lived in epochs when the Flora and Fauna considerably differed from those at present existing ; he was the contemporary of a number of species now only existing in a fossil state ; and whosoever has formed an idea of the slowness of such changes effected on our globe, will easily convince himself that six thousand years constitute but a short moment in the life of humanity.

Human palæontology enables us to solve in a decisive manner a problem which has at all times occupied and divided the mind. Creeds spread amongst many peoples, represent the first men as superior in

strength, beauty, intelligence, virtue, to their degenerate posterity, and under various names assume a golden age of the dawn of humanity; whilst on the contrary many philosophers look upon the primitive ages as periods of profound barbarism and savagery. The latter opinion irresistibly flows from the study of the most ancient relics of the existence of man. What mythology has called the golden age is now called the stone age. The stone age is that long and dark period in which the use of metals was unknown. The first men lived in small wandering tribes, inhabiting caves, and possessing no other arms than fragments of flint, which they knew not even how to polish. At a period infinitely nearer to us their primitive industry became gradually more perfect. They learned to polish flint weapons, and fabricate rude pottery, to work bones of the stag and of other large animals into arms or other implements. The use of metals constitutes a second period. Copper, and bronze (an alloy of copper and tin), were the only metals known during many centuries, constituting the Bronze Age. Then came iron, a metal incomparably more powerful, but more difficult to extract and to work, which supplanted the former. From the period of the Iron Age, man, provided with irresistible instruments, was enabled to till the ground, to destroy the large animals, cut down the forests, build cities, and form nations. That hard metal which, in the language of the ancient poets, symbolised human perversity, characterises, on the contrary, in the eyes of modern science, the third age of industry, security, stability, and true civilisation. It was thus by an extremely slow progress that man gradually rose from a savage to a barbarous state—from barbarism to civilisation. This evolution, the different phases of which are described by archæology and palæontology, is still observed in inferior or less advanced races.

The antiquity of man once established, the obscurity surrounding the origin of humanity becomes still deeper as we penetrate the depth of time. Two doctrines, as old as the most ancient traditions, are brought here face to face. Many peoples of antiquity considered themselves as offsprings of the soil which bore them, and rejected all idea of parentage with foreign races; others, whose belief has become an article of faith among the greatest modern nations, make the whole human species descend from a single pair. These two doctrines, separated, as must be well understood, from its theological element, which must remain foreign to scientific research, are known in anthropology by the names of *polygenism* and *monogenism*. The questions allied with them are numerous and important. The first is that of *permanence of types*, of which we have already said a few words. The problem is to know whether the external modifications produced by the action of the media may induce in the physical characters serious

and definitive changes, and whether, in consequence of such changes, become hereditary, types so differing as the Ethiopian and the Caucasian types may be produced in peoples derived from the same stock.

This question of the origin and formation of races comprises a number of subjects which we shall merely enumerate. The historical documents not always possessing the desirable precision, and direct observation being impossible, analogy is appealed to, and documents are borrowed from zootechnics, more or less relative to the natural or artificial formation of races of domestic animals. But the data derived from this study can only be applied to man with the greatest reserve, since every group of animals can be subjected to particular laws, and because the methodic choice of reproduction, the special education of the products, the breeding in and in, and the determined direction of the crossings which form the principal means of zootechnics, have evidently never been applied to humanity, where the union of the sexes is never directed by motives of this kind. The study of the conditions under which this union is effected thus acquires great interest. The degree of resemblance or dissemblance in the parents is, indeed, far from being without influence on the results of the generation, and the two extreme cases of consanguine union and the crossing of individuals belonging to different races deserve to be carefully studied.

Although to a great extent removed from the causes which, in domestic animals, give rise to the formation of new races, man is not less subject to influences of extremely different and powerful media. He is, or rather believes himself to be, a cosmopolite. He bids defiance to all climates where other men can live, and his distant colonies constitute real experiments of which science must study the results. The action of a new climate may affect the health of the individual, his fecundity, the health of his offspring, and obstruct the preservation of the race. But when the race resists this test without having recourse to crossing, does it preserve its primary characters, or does it experience more or less profound transformations?

The social influences are not less deserving attention. To cite only one: Who can deny the anthropological importance of the institution of marriage and of its various forms? The promiscuousness of the sexes, polygamy, polyandry, monogamy, have so different consequences as regards the reciprocal selection of the parents, and the physical, intellectual, and moral education of the children, that frequently little more is required to understand and explain the destiny of a race. In the normal condition of things, woman's mission is not merely to bring forth children and to suckle them, but to attend to their early

education, whilst the father must provide for the subsistence of the family. Everything that affects this normal order necessarily induces a perturbation in the evolution of races, and hence it follows that the condition of women in society must be most carefully studied by the anthropologist.

The influences of climatic and hygienic conditions, of sexual selections and the social state, are not the only ones which may exercise a more or less durable action on the organisation of man. Peculiar practices, at times very grotesque, much spread among a great number of peoples, subject certain parts of the body to more or less serious deformations and mutilations. Some, as tattooing, are quite superficial, forming, so to speak, the national costume. Others, as circumcision, piercing the ears, lips, or nose, the extraction or filing of the teeth, the amputation of a phalanx or of a whole finger, the constriction of the chest, the compression of the feet, the flattening of the nose, the ablation of a testicle, etc., alter the form and the functions of the respective organs and constitute real mutilations. Others, finally, the most serious and strangest of all, affect the conformation of the cranium and the development of the brain. These various manifestations of national fancies, more than once sanctioned by religious legislation, are not confined to the modification of accessory organs; they extend to the transformation of craniological characters, characters of the first order upon which the distinction of types is based. We may therefore say that to a certain extent they change the type of the individual; and if a whole people has for a series of generations been subjected to the same deformation, it may be difficult to detect beneath these artificial characters the natural characters of the race.

But here a more serious and more general question presents itself, that of hereditariness, climate, mode of life, the social state, mechanical mutilation and deformation, may, in unequal degrees, modify the individual without resulting in a modification of the race. Race is not merely an ensemble of individuals, but a series of generations. Even when all the individuals of a generation present a common character, is this character not that of the race, unless it is *naturally* transmitted to their progeny. Consequently a race can only be considered as modified when the new-born child, without having been subjected to the action of the various circumstances which have influenced the parents, already bears the stamp of the peculiarities which distinguish them, or at least ultimately shows these peculiarities as a consequence of natural development, *i. e.* without the concurrence of circumstances which have engendered them in previous generations. The study of the modifications produced in man by the action of media cannot

explain the question of the permanence or variation of type, unless it is followed up by the study of the laws and the phenomena of hereditariness. It is well known that most of accidental characters are not hereditary. The son of a peasant, tanned by the sun, is as white as the son of the most delicate citizen, and he would remain so were he not to follow up his father's profession. The son of a person who has lost a limb by amputation comes into the world with all his limbs; and if circumcision is still practised among the Jews, it is simply because the new-born children have not inherited the peculiarity from their fathers. But these are local modifications, lesions or alterations of organs, which only occupy a secondary rank in the functional hierarchy; and it may be asked if the changes of a more general nature affecting the constitution in its *ensemble*, or only an essential organ like the brain, may not in length of time, at the end of a number of generations, make part of the organism, become hereditary, and definitively alter the characters of the race. Thus the study of hereditariness, already so important in pathology, acquires a still greater importance in anthropology.

Individual spontaneous variations, which differ essentially from accidental or acquired variations just spoken of, may be transmitted for several generations, and by profiting of these spontaneous variations, by coupling animals possessing the same anomalies, breeders frequently succeed in producing new races. But the primitive type, although profoundly modified by these methodical perturbances, does not altogether lose its rights. It tends to re-establish itself despite the laws of direct hereditariness, and we see suddenly appear in the new race, in a certain number of individuals, one or several characters which do not exist in that race, and which altogether or partly reproduce the effaced type of the old generations. *Atavism*, that is, the resemblance to an ancestor more or less remote, is therefore engaged in a struggle with hereditariness, properly so called; and if the breeders did not take the greatest care to suppress or sterilise the individuals returning to the primitive type, the latter might finally absorb the whole race. It is a well known fact, that it is easier to make races than to preserve them. They all tend, as M. Flourens expresses it, "to unmake themselves" (*à se défaire*), that is to say, to return to their primitive type. This tendency not only exists in races obtained by selection, but in races obtained by crossing. In the latter case, the produced hybrids may, at the end of several generations, return all at once to the type of either of the mother races. But the phenomena of atavism may be observed in the human species quite as well as in domestic animals; so that the problem of the variability of type is not solved, if it were stated that an accidental charac-

ter is transmitted by hereditariness. It would still be requisite to investigate whether the laws of atavism do not reproduce at the end of several generations the ancient type which had momentarily been altered. This is sufficient to show all the interest which attaches to the study of atavism.

These are the chief questions which general anthropology comprises within its domain. We have preferentially cited such as, without distinction, interest all men of science, and such which possess a special interest for the physiologist and the physician; but we have been obliged to pass over a great number, in order not to lengthen this article. The reader will easily fill up the gap, if he attends to the definition we have given of general anthropology, or to that other less rigorous but, perhaps more striking, definition—*general anthropology is the biology of the human species.*

DAVIS AND THURNAM'S CRANIA BRITANNICA.*

OF the various branches of the science of anthropology, none, except some of those which deal with prehistoric man, can be said to have been originated in our own time, but several have received a development altogether out of proportion to their previous condition. Among these is craniology, the students of which have within our own times found it necessary, in order to express their ideas with precision and brevity, to coin an altogether new system of nomenclature, an introduction to even a portion of which, as exhibited, say, in Professor Owen's note to Du Chaillu's *Journey to Ashango-land*, would have been enough, one would think, to make the hair of the venerable Blumenbach to stand on end. The heads of Blumenbach and Morton adorn the title-cover of each decade of the *Crania Britannia*, in token, we suppose, of the admiration entertained by the accomplished authors of the work for the father and grandfather of their science. They were great men, and their names will live long; but the present generation have the advantage of standing on their shoulders, and certainly see much further than they could. Must we add, that the prospect unfolded to them remains yet misty and obscure? We fear so. None of the great generalisations of craniologists appear to us so securely fixed

* *Crania Britannica, Delineations and Descriptions of the Skulls of the Aboriginal and Early Inhabitants of the British Islands, etc., etc.* By Joseph Barnard Davis, M.D., F.S.A., etc., and John Thurnam, M.D., F.R.C.P.L., F.S.A., etc. London: 1856-65.